WLINK-SWUT-M4S
1-to-4 way Gang Programmer
Operation Manual

REV. 1.0

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Version	Date	Applicant	Description
V1.0	2014/06/18	Louis	Initial version

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Chapter 1 WLINK-SWUT-M4S SET UP

1.1 WLINK-SWUT-M4S Introduction

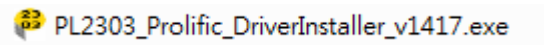
WLINK-SWUT-M4S is a 1-to-4 way gang programmer which supports 4 pieces of IC programming simultaneously On-Line or Off-Line with PC and it is suitable for IC programming in mass production stage.

1.2 WLINK –SWUT-M4S DRIVER SET UP

Use PL2303 USB to UART chip

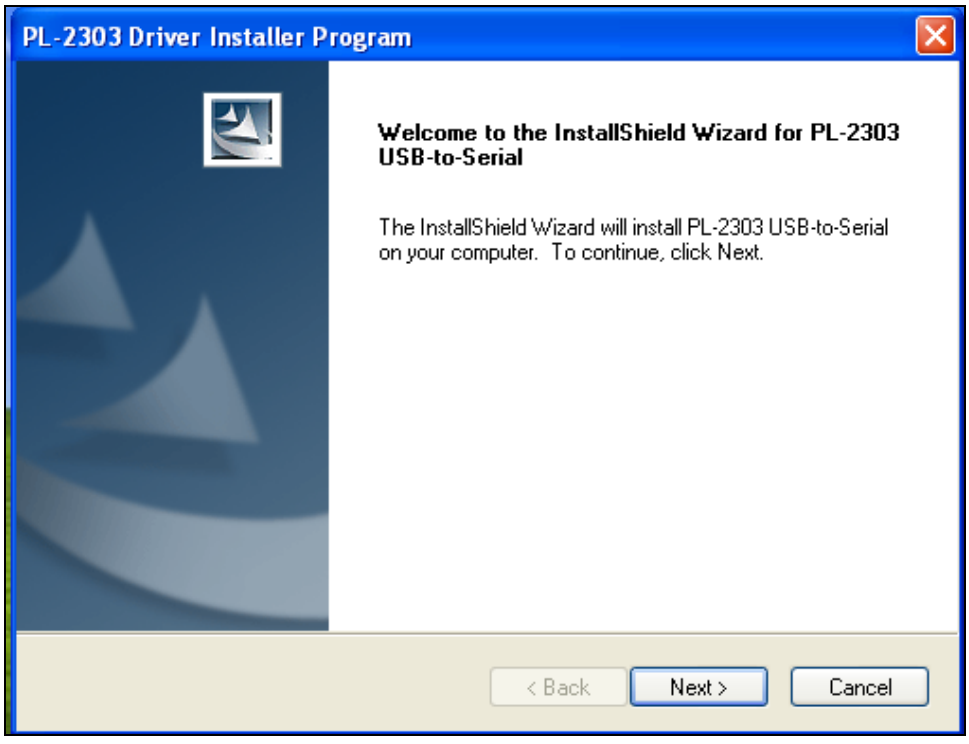
【Step 1】 Install WLINK USB to UART Driver:

- Click PL-2303_Driver.exe in the disk then open installation program.



- For the newest version of driver program and download information, please see Prolific company website: http://www.prolific.com.tw/US/ShowProduct.aspx?p_id=225&pcid=41

【Step 2】 Now the screen will show **"Welcome to the InstallShield Wizard for PL-2303 USB-to-Serial"**, and then press **"Next"** to install.


PL-2303 Driver Installer Program
Welcome to the InstallShield Wizard for PL-2303 USB-to-Serial
The InstallShield Wizard will install PL-2303 USB-to-Serial on your computer. To continue, click Next.
< Back
Next >
Cancel

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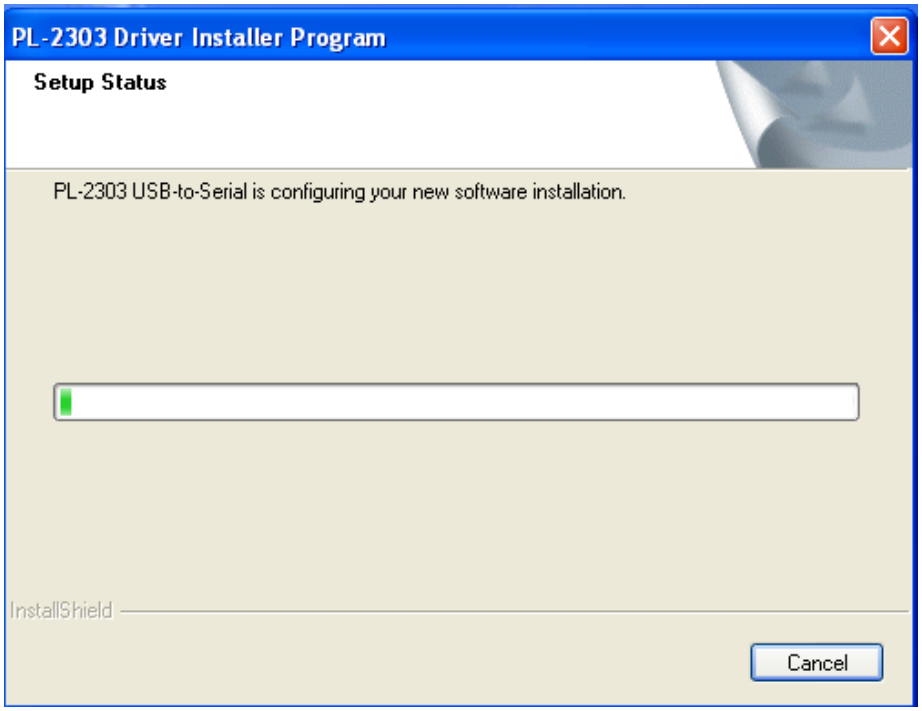
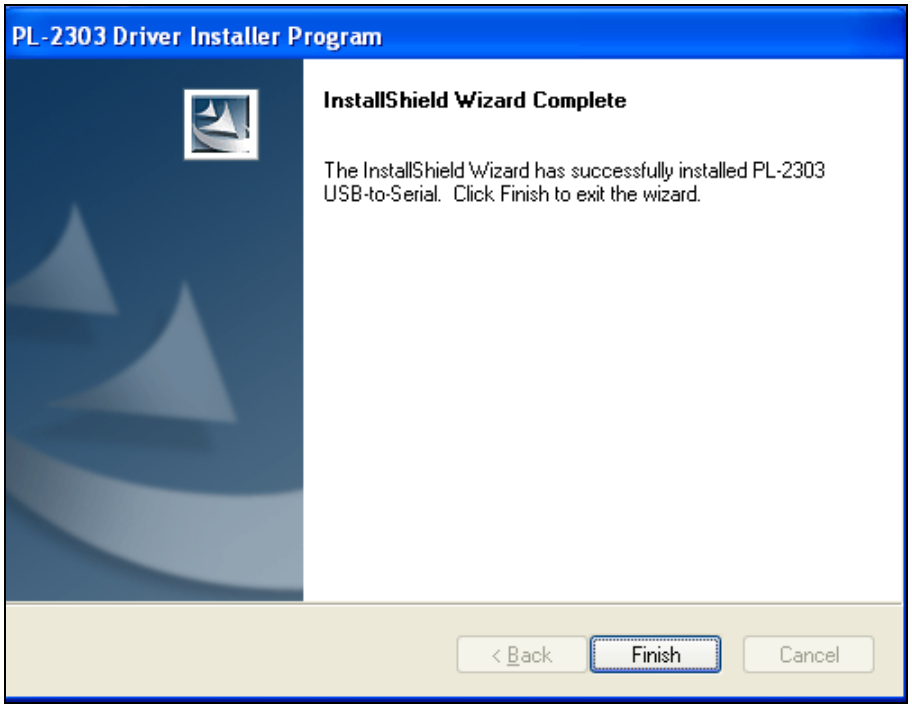
【Step 3】 Driver program will start installing procedure, and then execute the installation.



【Step 4】 Click **"Finish"** to exit the installation process. If WLINK has connected to PC, please re-plug USB cable to make PC examine the installed device.


PL-2303 Driver Installer Program
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed PL-2303 USB-to-Serial. Click Finish to exit the wizard.
< Back
Finish
Cancel

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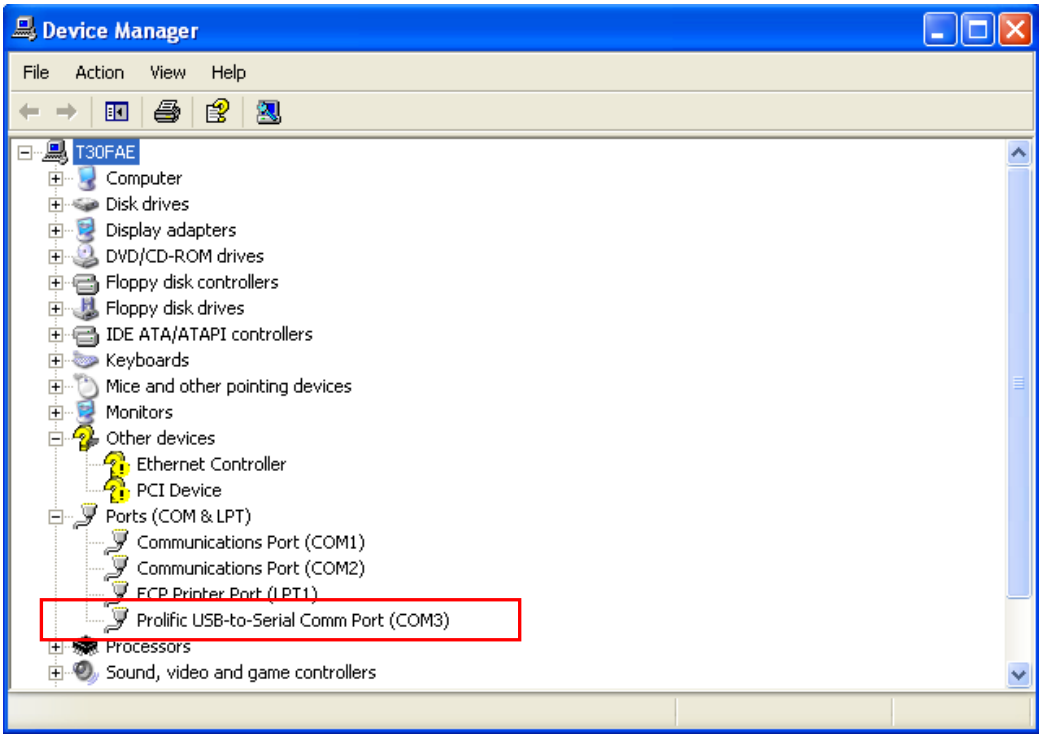
【Step 5】 After re-plugging, it can open Device Manager and then see **"Prolific USB-to-Serial Comm Port"**. It means WLINK has recognized UART device in the PC, and Windows has assigned appropriate COM Port.



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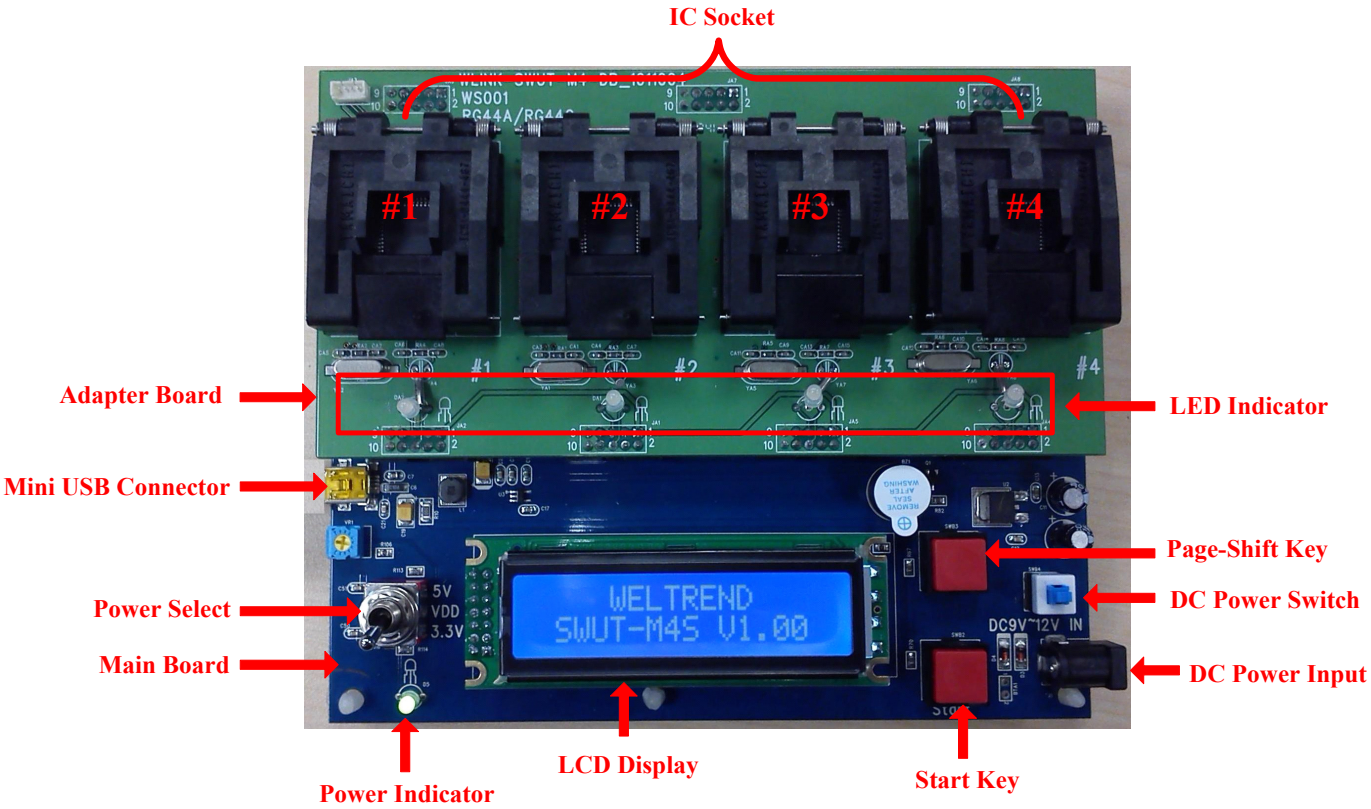
Chapter 2 WLINK-SWUT-M4S HARDWARE DESCRIPTION

2.1 WLINK-SWUT-M4S HARDWARE OVERVIEW



- **Main Board & Adapter Board**

  WLINK-SWUT-M4S is consisted by Main board and Adapter board, Main board provides programming control and the adapter board provides different kinds of textool for different packages.

- **Mini USB Connector**

  Connect to PC for programming purpose or download and update Weltrend system software, and also offer DC 5V for system use.

- **Power Select**

  It provides two-kind programming voltage, namely 5V and 3.3V.

  Green Lighting: 3.3V programming voltage

  Red Lighting: 5V programming voltage

  (Don't change switch during programming for preventing failure)

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- **LCD Display**

  It provides the contents of system version, check sum, programming succeeded/failed counts, and programming limited quantity.

- **Start Key**

  Press the key to perform off-line programming.

- **DC Power Input**

  It supports DC 9V~12V power input at off-line operation.

- **DC Power Switch**

  Turn on/ Turn off DC 9V~12V.

- **Page-Shift Key**

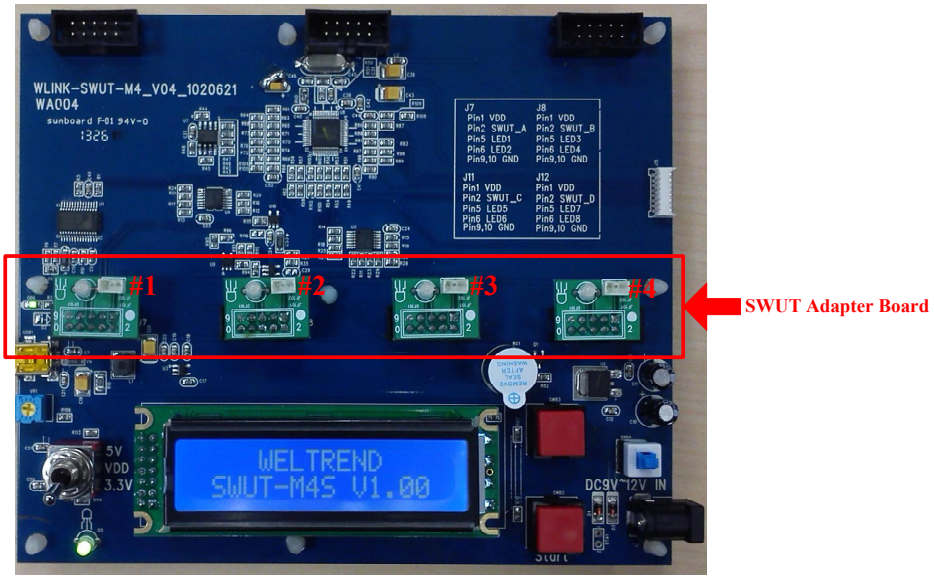
  Press the key to Shift between programming information.

- **LED Indicator**

  It shows the programming results of MCU #1~#4.
  Orange Lighting: indicates programming is proceeding
  Green Lighting: indicates programming is successful (PASS)
  Red Lighting: indicates programming is failed (FAIL)

2.2 WLINK-SWUT-M4S With SWUT ADAPTER BOARD HARDWARE OVERVIEW

WLINK-SWUT-M4S can be used with SWUT adapter board and COB/Customer target board programming.



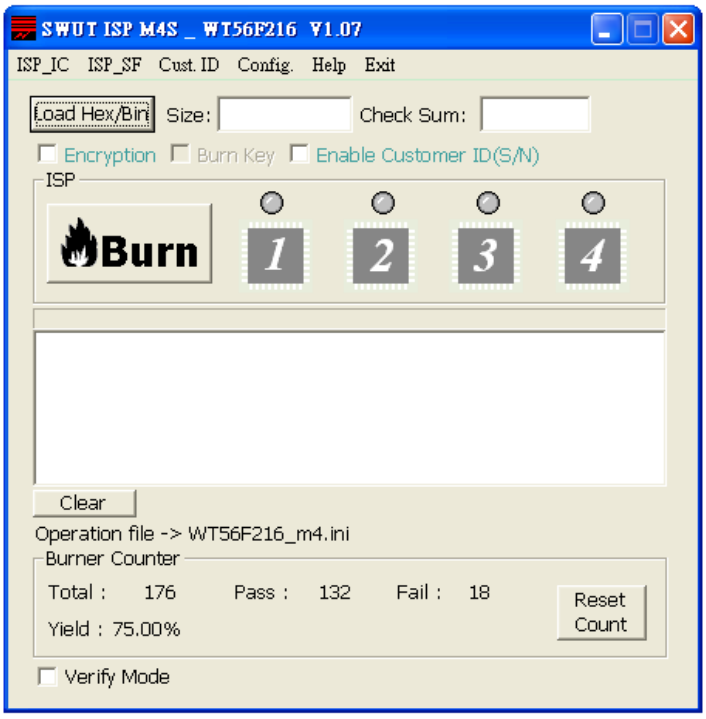
Chapter 3 PROGRAMMER INTERFACE

3.1 WLINK-SWUT-M4S PROGRAMMER INTERFACE

Please go to Weltrend Company Website to download SWUT_M4S.exe execution file.

Click SWUT-M4S ICON to Start Programming

➢ The Figure-2 shows the start screen of SWUT_M4S:



(Figure-2)

➢ SWUT ISP program start screen description:

- ISP_IC: Programming window. (refer to CH-4.1)
- ISP_SF: Programming flash interface. (refer to CH-4.2)
- Cust. ID.: Customer ID setting window. (refer to CH-3.3)
- Config.: Configure the COMport and BaudRate. (refer to CH-3.2)
- Help: Version & technical contact window.
- Exit: Exit system.

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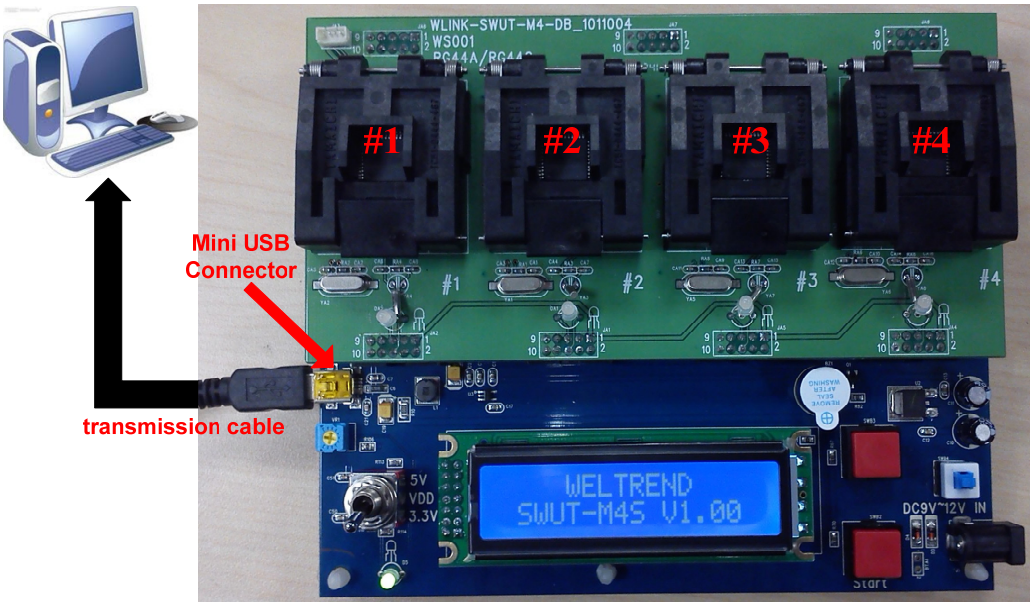
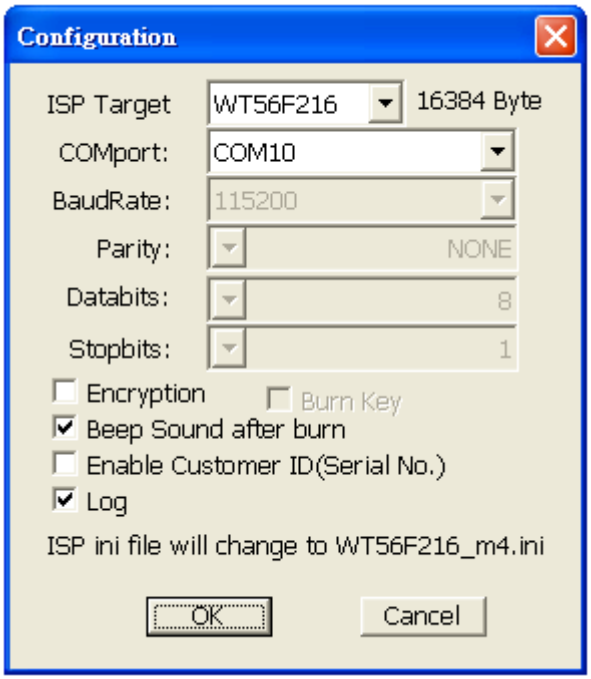
3.2 SWUT-M4S CONFIG. INTERFACE

Before setting, please check if the installation of WLINK-SWUT-M4S driver is finished.
(refer to CH-1.2 WLINK –SWUT-M4S Driver set up)
And check whether PC links to WLINK-SWUT-M4S USB Port (see Figure-3).
Click "Config." tab on Figure-2, a new screen (Figure-4) will appear.



(Figure-3)



(Figure-4)

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- SWUT_M4S Config. Program Interface description:
  - ISP Target: Select ISP Target (IC part number)
  - COMport: Select WLINK-SWUT COM port.
  - BaudRate: Default is 115200 bps.
  - Encryption: If marked, enable the encryption function then source code with 128 bit key do the code encryption.
    If no marked, disable encryption function. (refer to CH-3.4)
  - Burn Key: Please check this item while using IC encryption function. (refer to CH-3.4)
  - Beep Sound after burn: If marked, after programming finish, buzzer will generate one long beep sound if programming is successful or generate two short beep sounds if programming is failed.
    If not marked, after programming finish, no beep sounds. (Default is marked)
  - Enable Customer ID(Serial NO.): If marked, enable Customer ID function, programming IC will add serial programming function (refer to CH-3.3)
  - Log: If marked, Figure-5 red block shows the programming information.
    If not marked, Figure-5 red block shows no information. (Default is checked)

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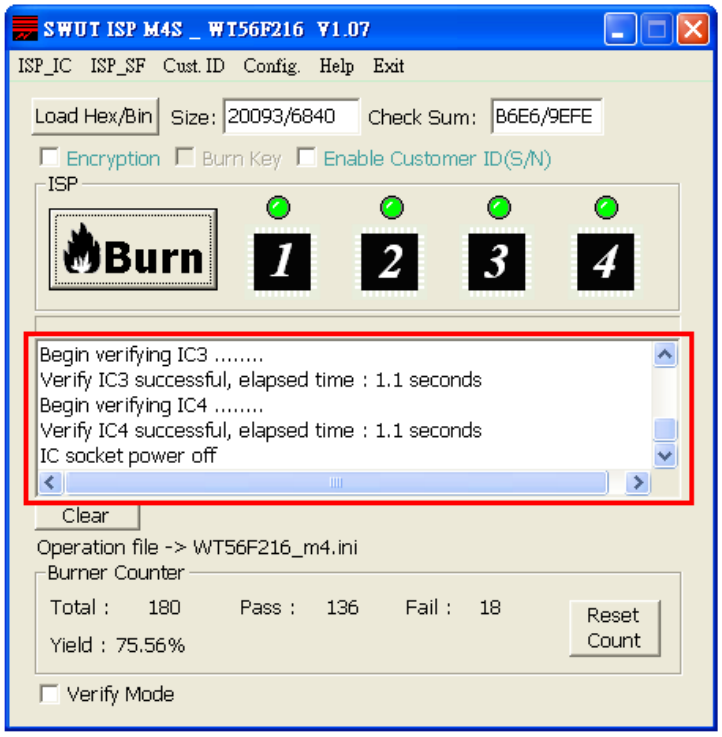

(Figure-5)

Press **"OK"** to finish setting. And then Figure-4 will be closed and back to Figure-2.

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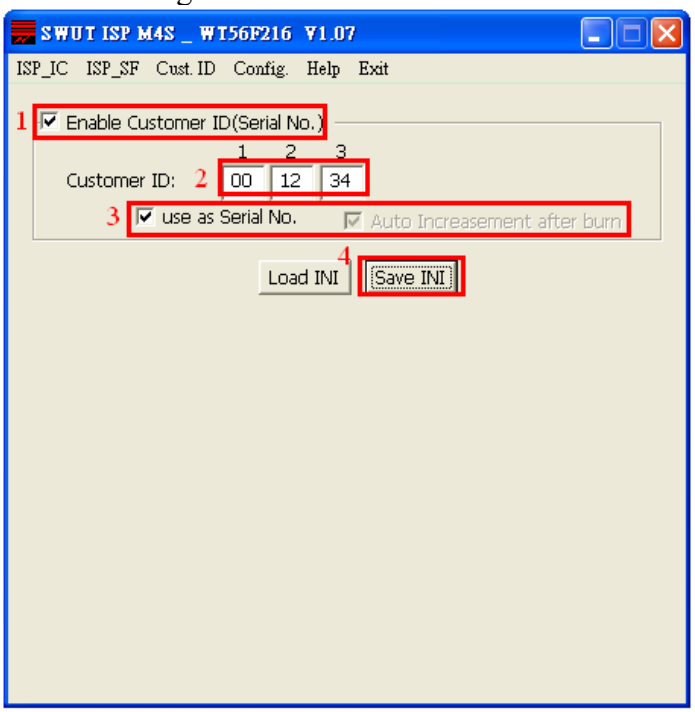
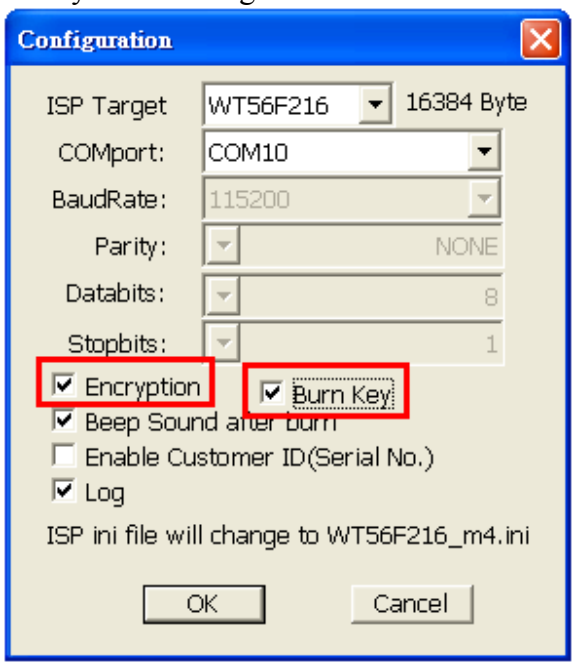
3.3 Cust.ID Programmer Interface Description Setting procedures:

1. Check **Cust.ID** tab, enable **Enable Customer ID(Serial No.)**
2. Setting **Customer ID initial value**: Customer ID only supports 3 Bytes, each byte ranges from 00 to FF, and the maximum setting value is FFFFFF. The example setting value is 001234.
3. Setting **Customer ID** auto increment function**,** increased by 1
4. Finish setting and save the setting value.



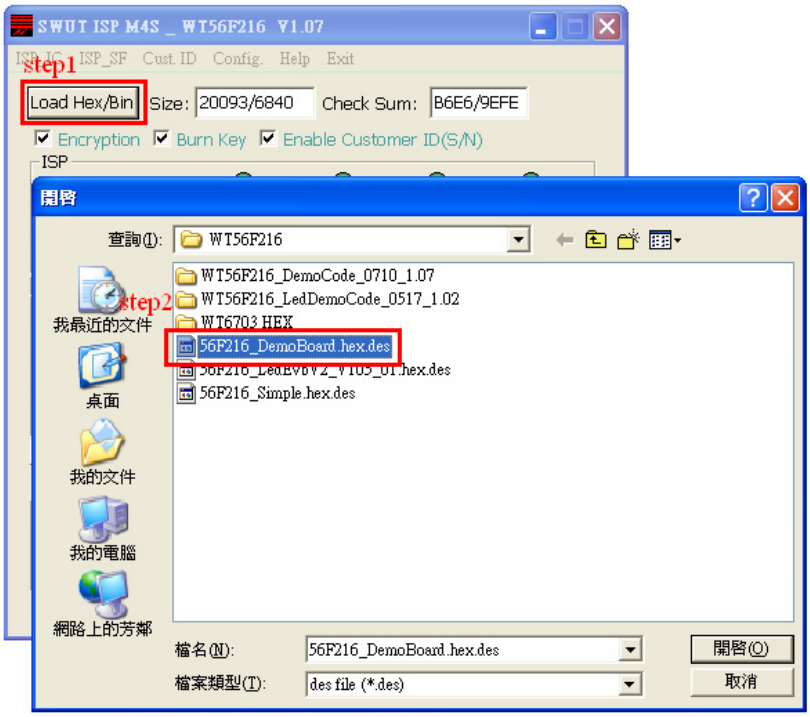
3.4 Encryption OPTION

When programming Encryption text, click **"Config."** tab, select TARGET IC and COM port, and then checked Encryption & Burn Key items on Figure 7 red blocks. Click OK to finish the setting.



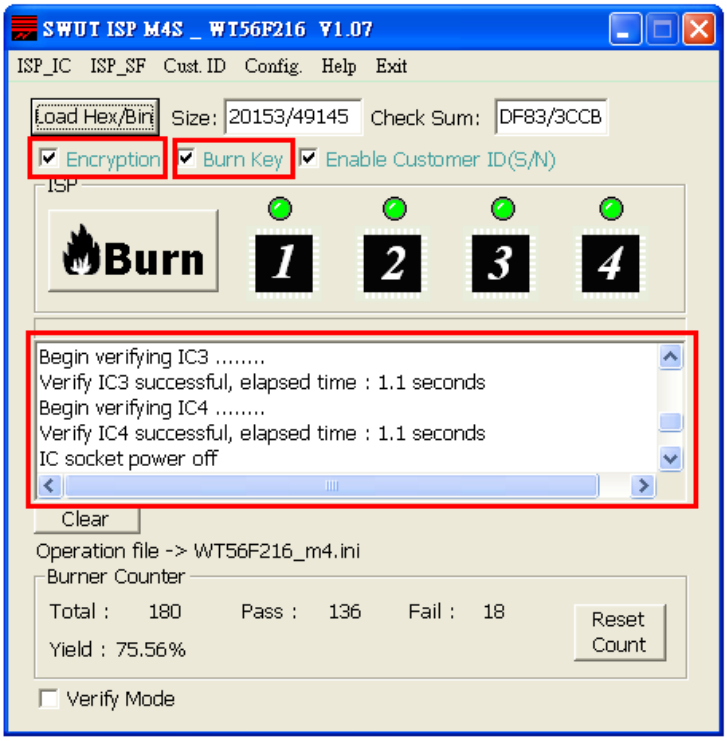
(Figure-7)

➢ Click LOAD Hex/Bin on ISP_IC tab to select the .des file, see Figure-8 red blocks.



(Figure-8)

➢ Select the file and then check if Encryption & Burn Key is checked on ISP_IC window, and a blank frame has a set of golden key & programming .des file (see the red frame in figure 9). Then press the "**Burn**" button to finish programming encryption text file.



(Figure-9)

✧ If the encryption file is to be programmed to external Flash, click ISP_SF tab, and the rest procedures is same as Encryption Option (refer to CH-4.2)

3.5 Limited Maximum Quantity

- This function is to limit the quantity of SWUT-M4S programming IC. (**The limitation function only supports off-line programming**)
- As the hex file is programmed to serial flash, all records will be erased including: the quantities of successful programming, failed programming, and limited programming. Besides, in normal power down condition, M4S programmer records will not be erased; and also in abnormal power down condition, the records will not be erased, either.
- M4S Programmer will stop programming when the IC programming successful quantity reached the limited maximum quantity.
- Only after each successful programming, the successful and failed quantity will be counted, and then update the total quantity of programming. If powering down during programming process, this data is invalid, and will not be accumulated.
- Upload the programming program into M4S Programmer first, please refer to CH-4.2

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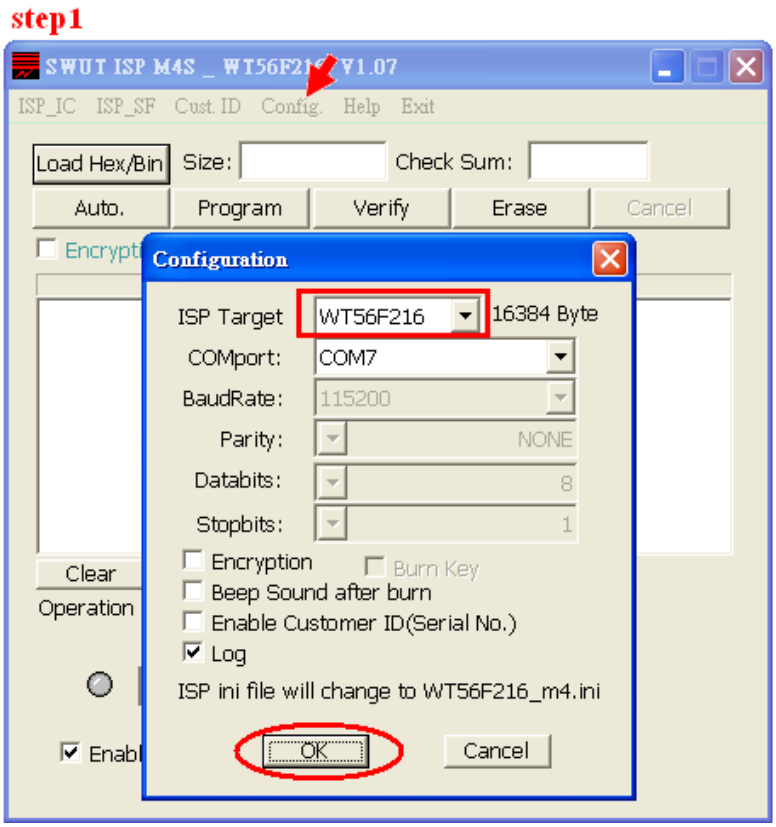
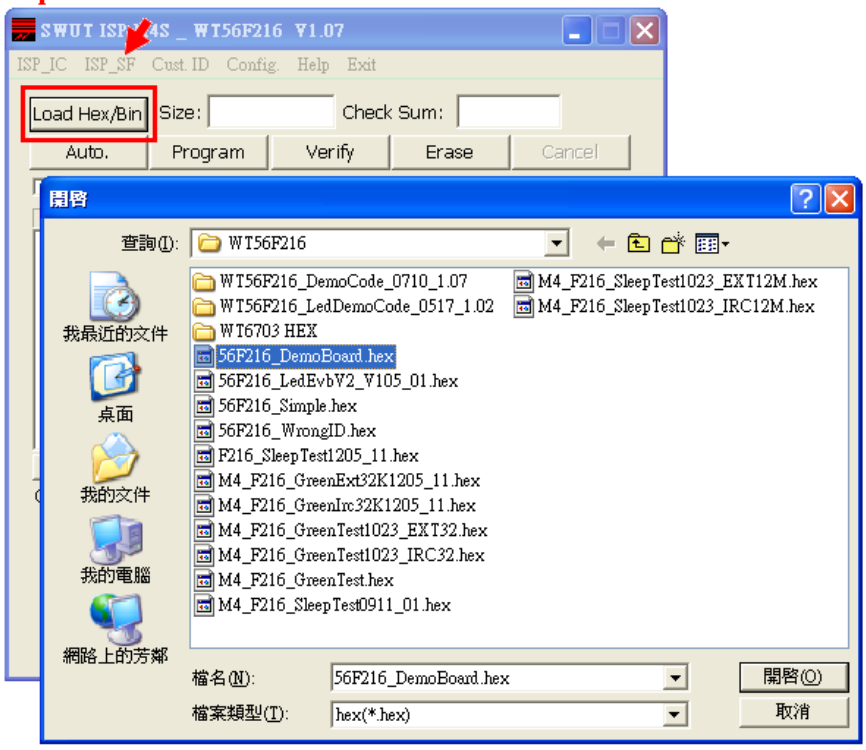
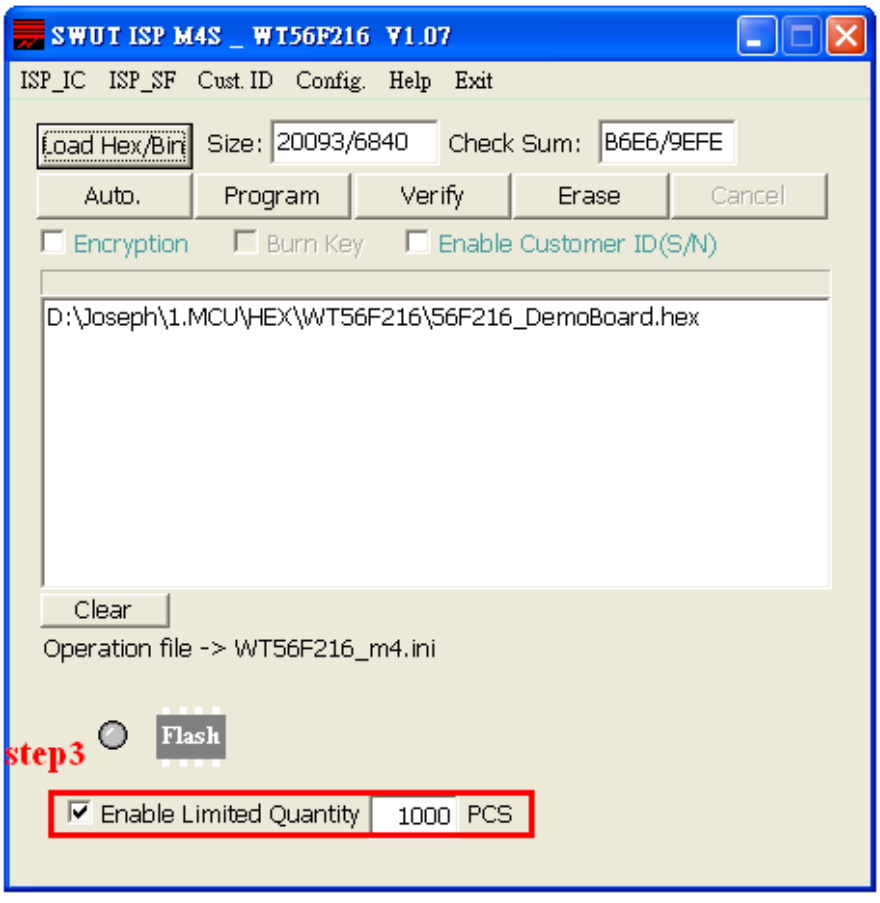
3.5.1 Setting Procedures

- Step 1. In SWUT_M4S program start screen click **"Config."** tab, setting the part number of programmer, such as: WT56F216, click **"OK"** after setting is complete.
- Step 2. Click **ISP_SF** page then press **"Load Hex/Bin"** download HEX file, such as **56F216_DemoBoard.hex**, **check Sum: B6E6/9EFE**
- Step 3. Enable **"Limited Maximum Quantity"** and setting quantity: such as setting programming 1000 pieces.
- Step 4. Press **"Auto"** and programming hex file into M4S programmer, flash lights green after programming is complete.



step2





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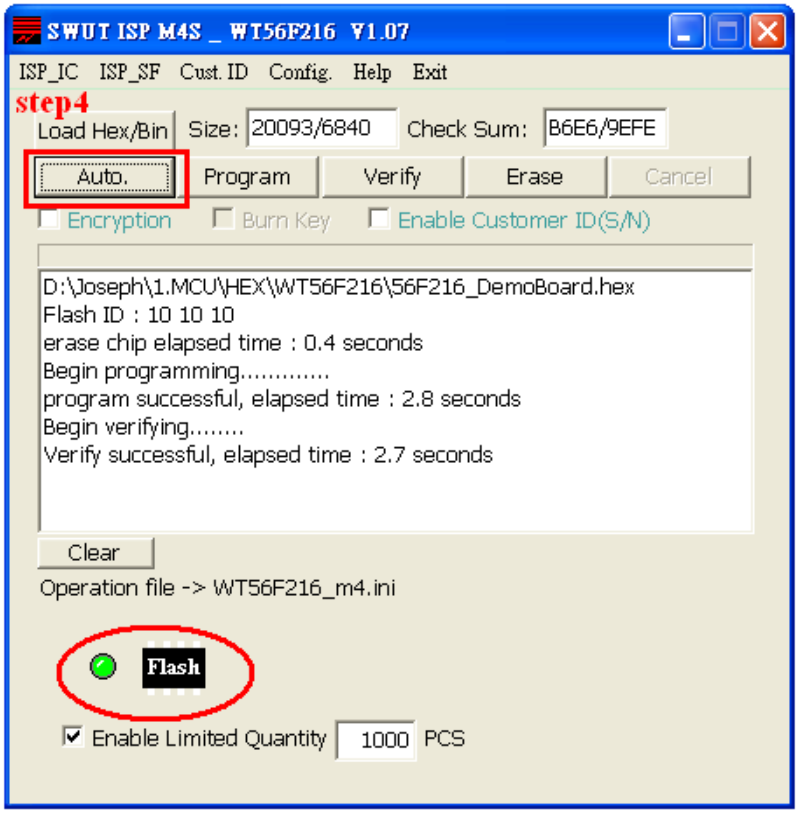
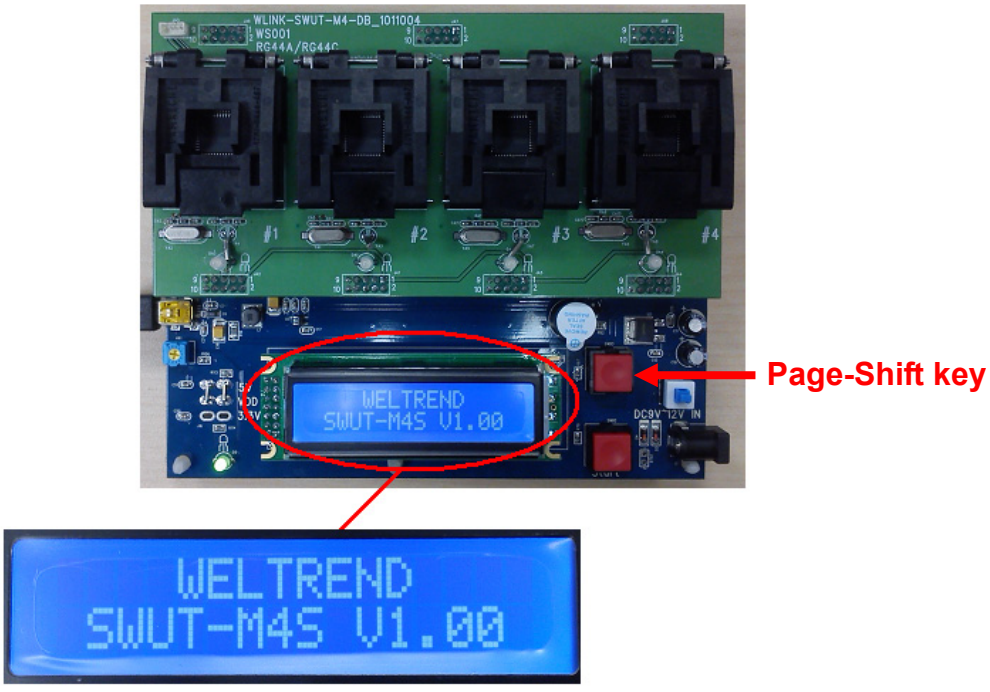


3.5.2 M4S Programmer LCD display description

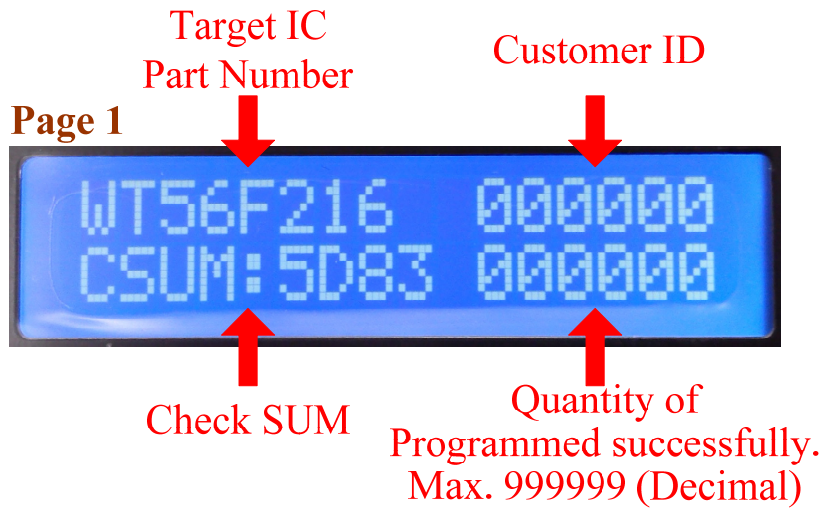
After programming "hex file" to M4S Programmer, LCD will switch to Page 0. Press "**Page-Shift Key**", LCD will display page 1 and page 2 alternatively. (If the serial flash of M4S Programmer does not contain programming program, Page Key is invalid.)

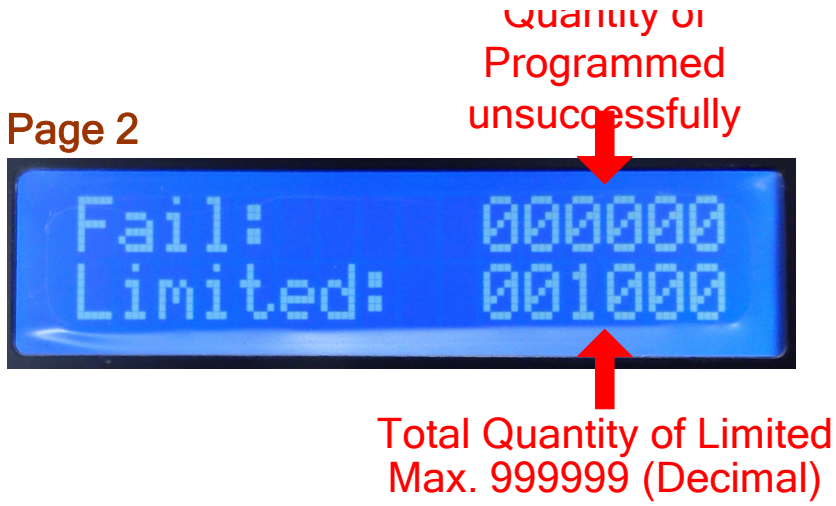


LCD Display description:

1. With enabling Limited Maximum Quantity function.

- Programmer version: WLINK-SWUT-M4S Programmer firmware version. The current version is V1.0 (refer to CH-5)





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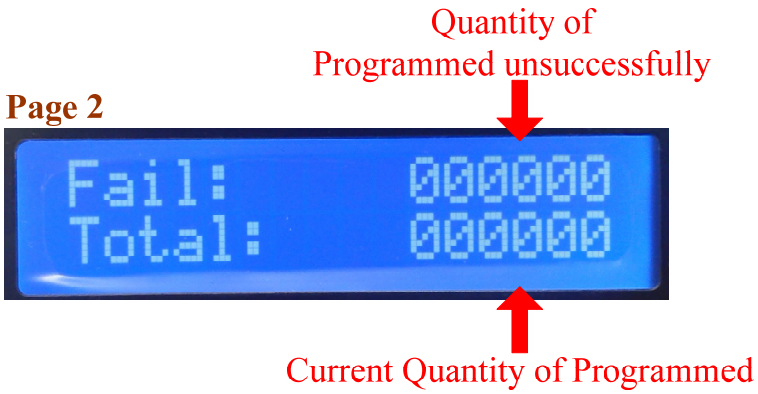
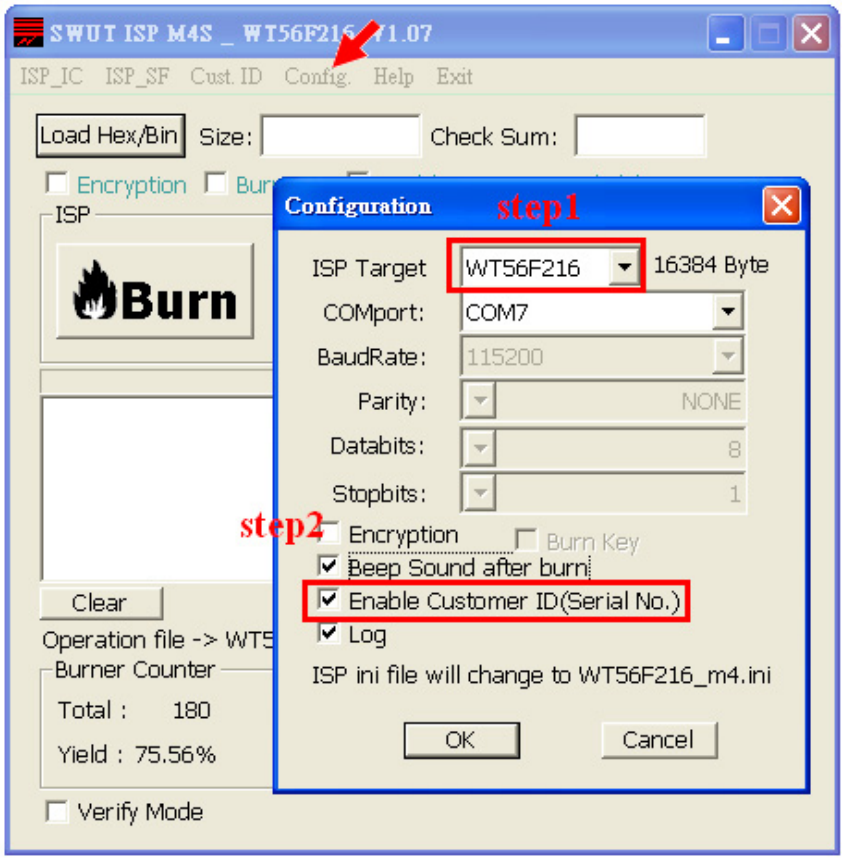
2. Without enabling Quantity of Limited function.
   The only difference with "With enabling Limited Maximum Quantity function" is Page 2, indicating the Current Quantity of Programmed.



3.6 Customer ID operation description

Setting procedures:

- Step 1. In SWUT_M4S program start screen, click **"Config."** tab and setting programming part number, such as WT56F216.
- Step 2. Enable **"Enable Customer ID(Serial No.)"** (refer to CH-3.3)
- Step 3. Select On-Line or Off-Line mode, upload Hex File and press the **"Auto"** button.



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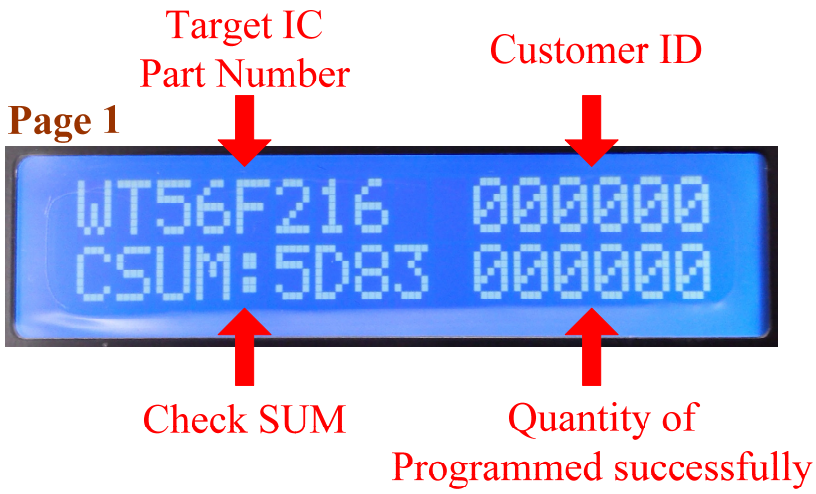
- If off-line programming mode is selected, after uploading programming program into M4S programmer, the display Page 1 of M4S programmer will appeared as below: (refer to CH-3.3)



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Chapter 4 PROGRAMMER OPERATION

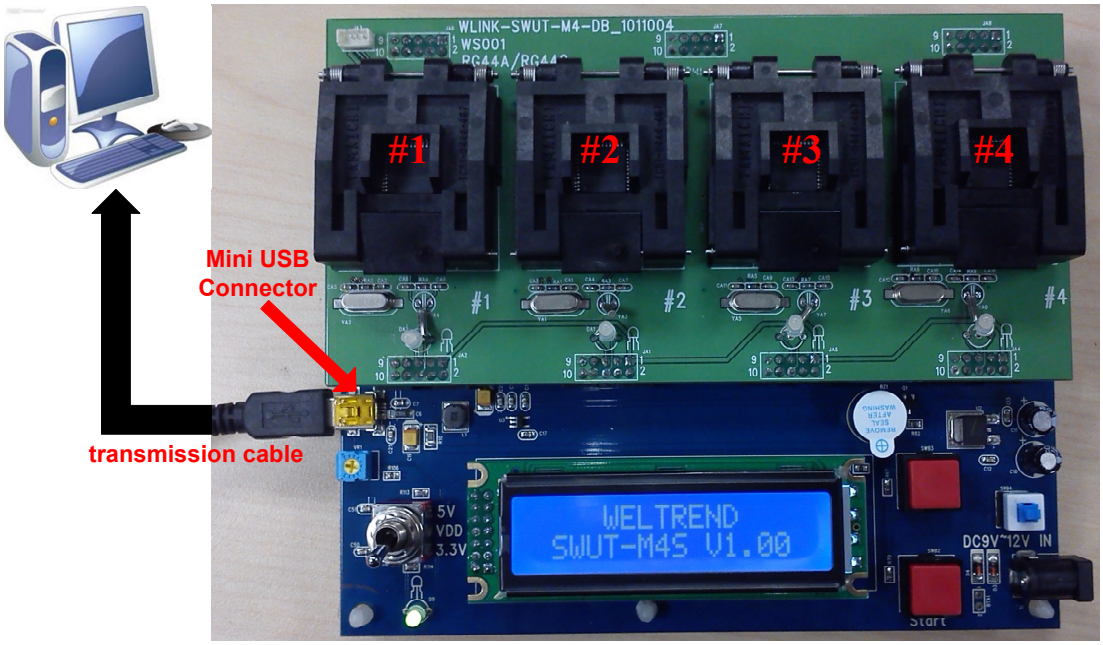
4.1 SWUT-M4S ON-LINE OPERATION

SWUT-M4S can execute **"Burn"** and **"CMP"** function on target IC program programming in On-Line mode.

4.1.1 Burn

This function is for SWUT-M4S programming with Target IC, with On-Line examples of WT56F216 IC as below:

Connect PC with WLINK-SWUT-M4S USB Port as below illustrated, and start SWUT-M4S program.



Burn setting procedures:

- Install WLINK USB to UART driver (Refer to CH 1.2)
- Click SWUT-M4S ICON start program

- Start program as below

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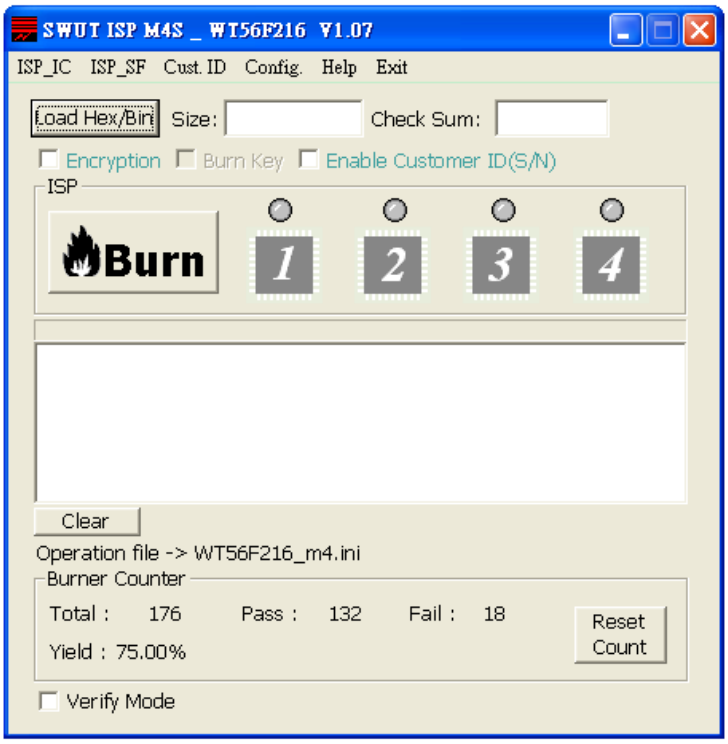
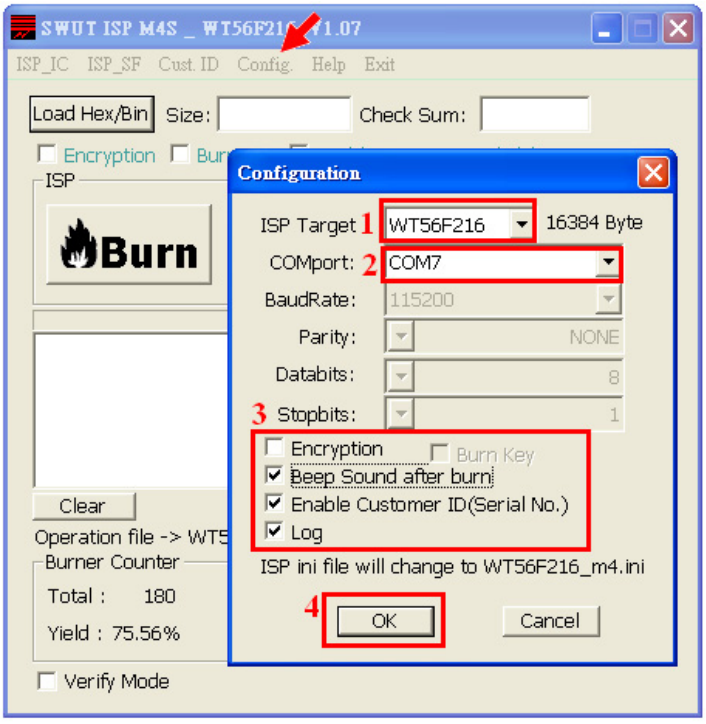
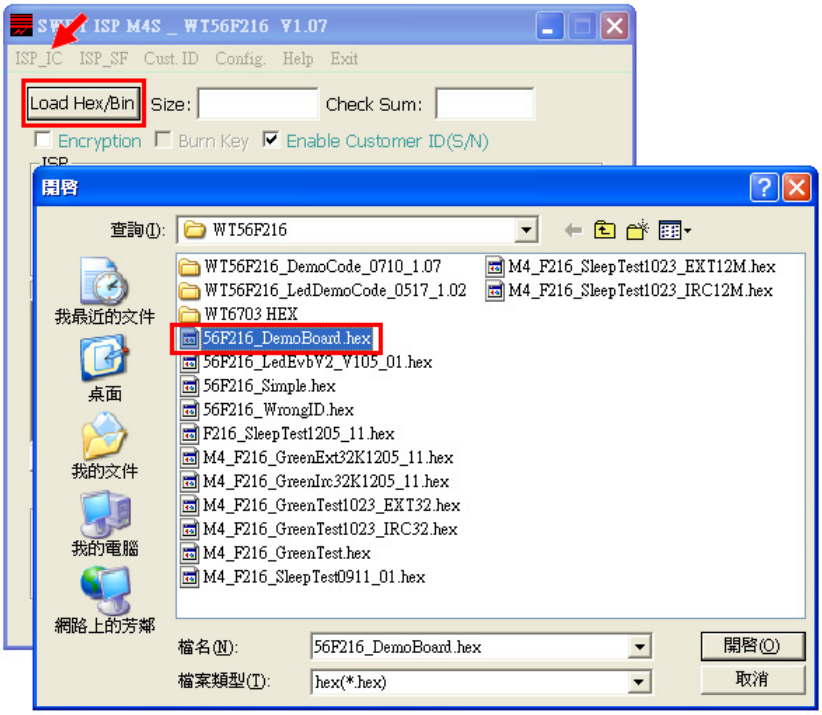


◆ Select **"Config."** tab

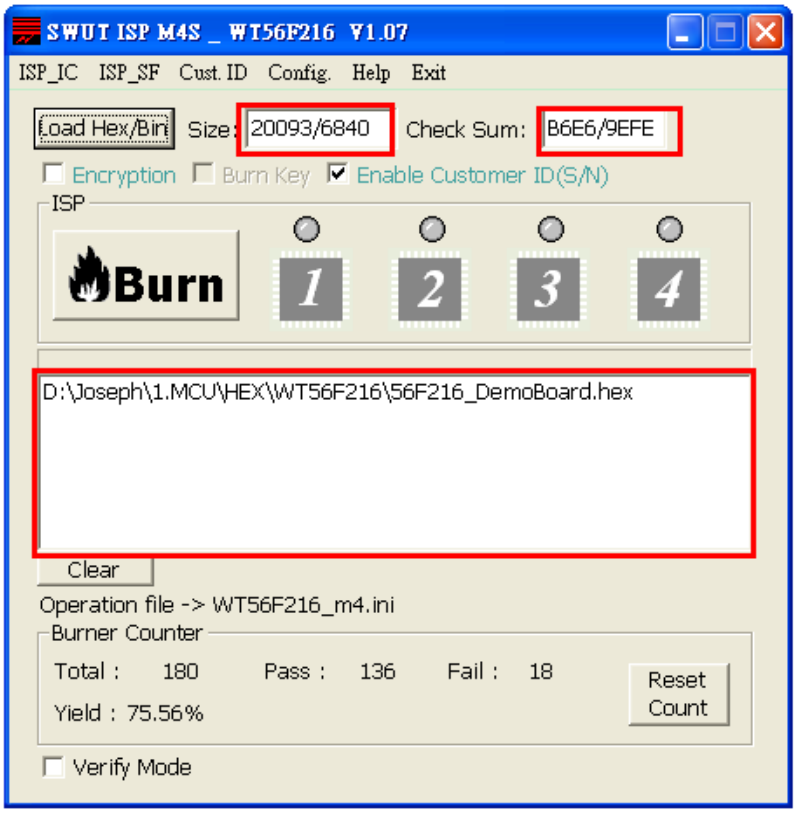
1. Setting programming Target IC
2. Configure COMport
3. Advanced setting, check programming mode (Refer to CH.3)
4. Click **"OK"** to finish setting



◆ Click **"Load Hex/Bin"** and select programming file.



◆ After selecting, Size column will display program size, Check Sum column will display Check Sum, and the blank will display file path and file name.



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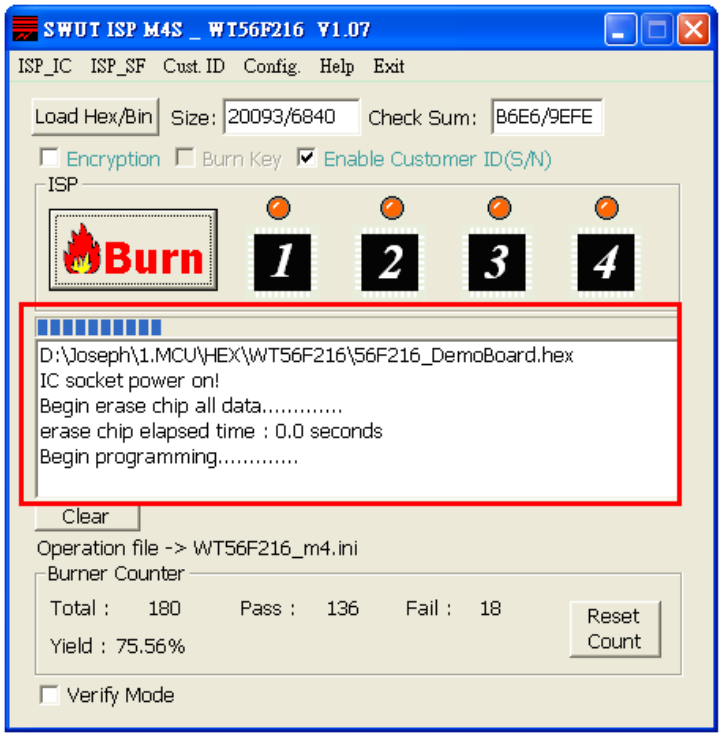
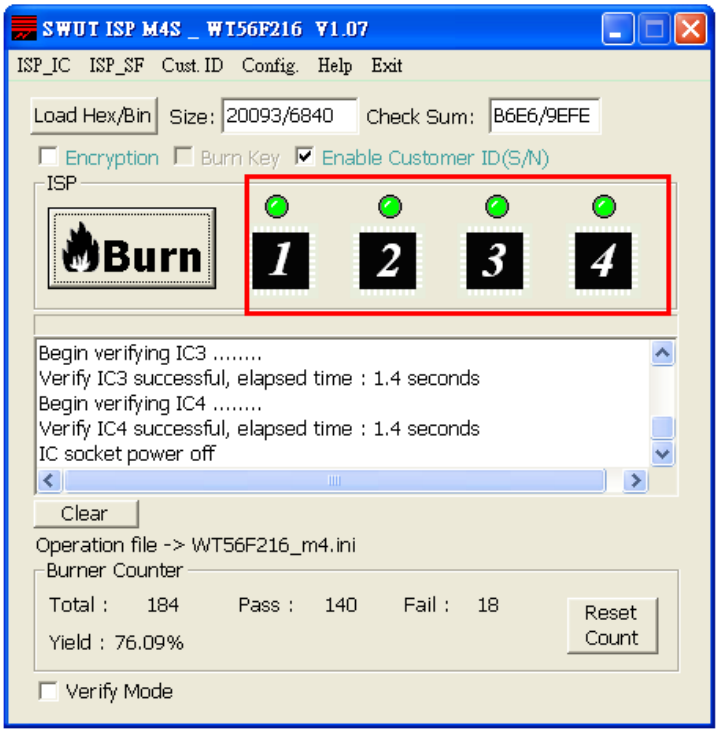
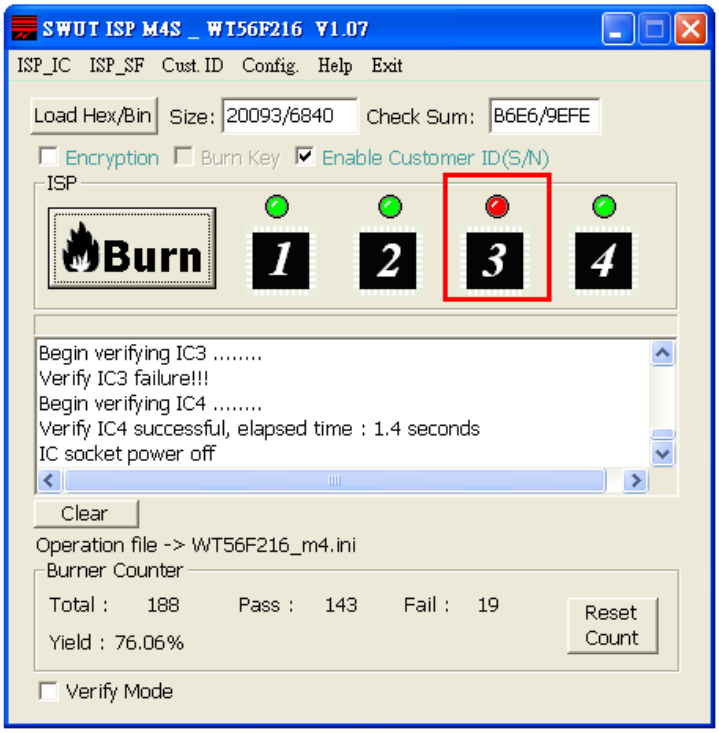
◆ Press **" Burn"** for programming.



◆ After programming is completed, green light indicated successful programming; red lights indicated failure.





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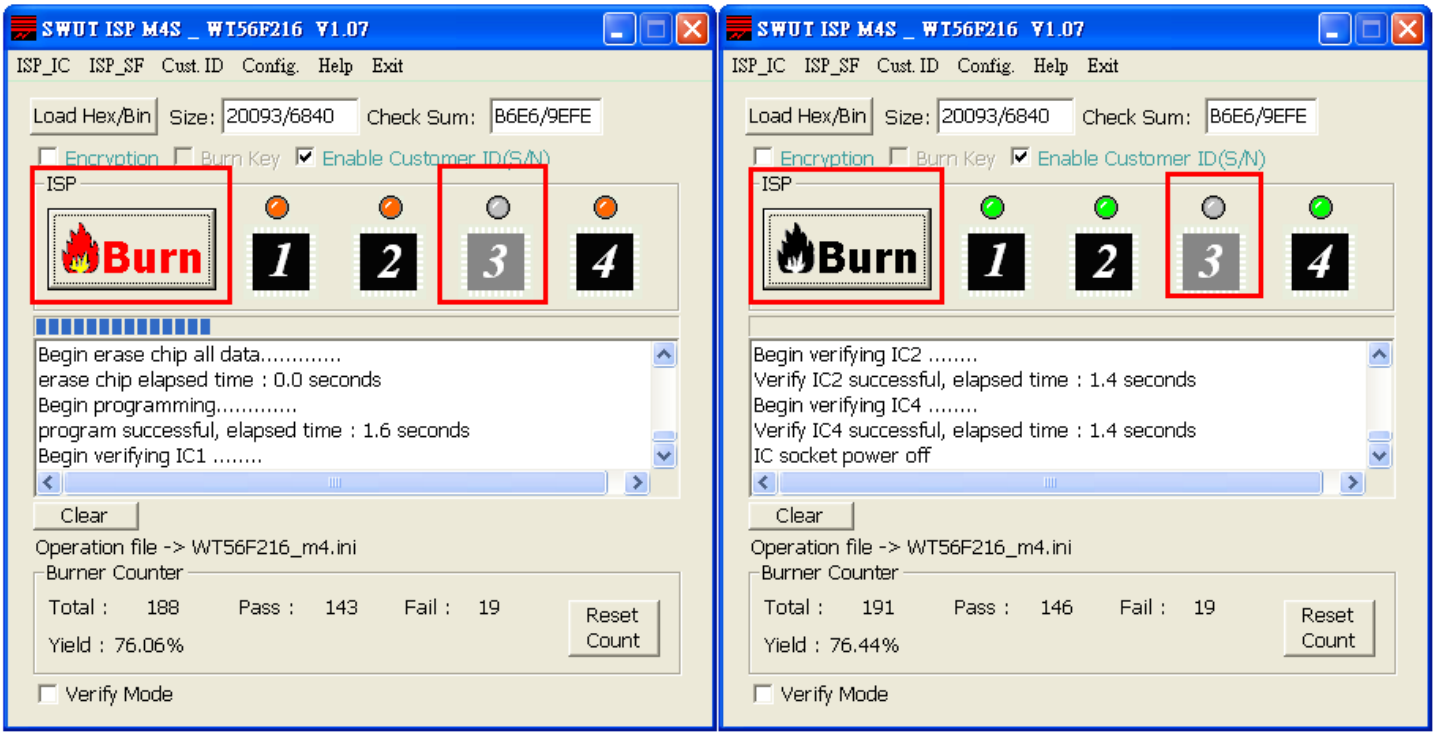
SWUT-M4S is 1-to-4 mass production programmer, and it also supports 1-to-1/1-to-2 or 1-to-3 programming. If no IC is placed in IC socket, no lights will appear on the corresponding IC ICON position while pressing **"Burn"** for programming and after programming is finished.


SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust. ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
Burn
1 2 3 4
Begin erase chip all data.....
erase chip elapsed time : 0.0 seconds
Begin programming.....
program successful, elapsed time : 1.6 seconds
Begin verifying IC1 .....
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 188 Pass : 143 Fail : 19
Yield : 76.06%
Reset Count
Verify Mode
SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust. ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
Burn
1 2 3 4
Begin verifying IC2 .....
Verify IC2 successful, elapsed time : 1.4 seconds
Begin verifying IC4 .....
Verify IC4 successful, elapsed time : 1.4 seconds
IC socket power off
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 191 Pass : 146 Fail : 19
Yield : 76.44%
Reset Count
Verify Mode

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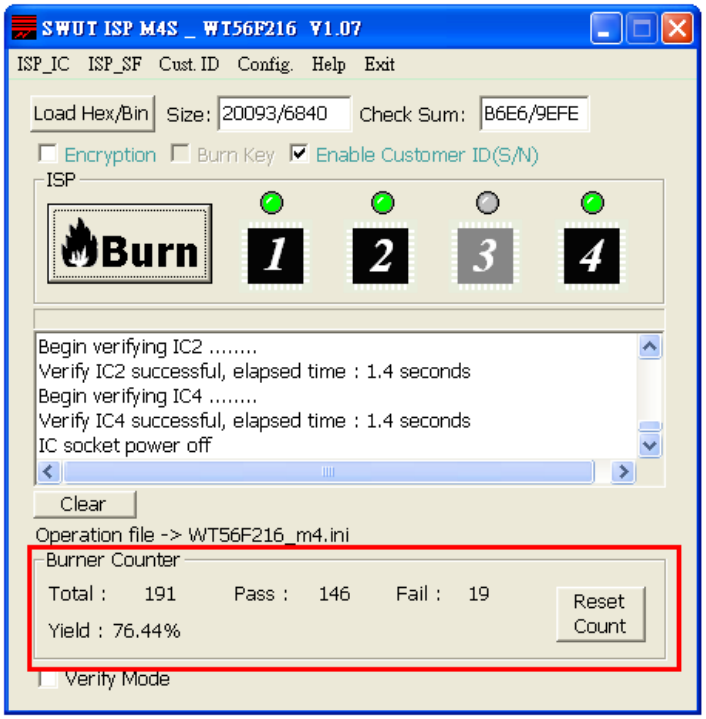
◆ Burner Counter calculates total programming quantities, and accumulated successful and failure programming quantities. Press **"Reset Count"** to reset. (maximum programming quantity is 4 ICs)



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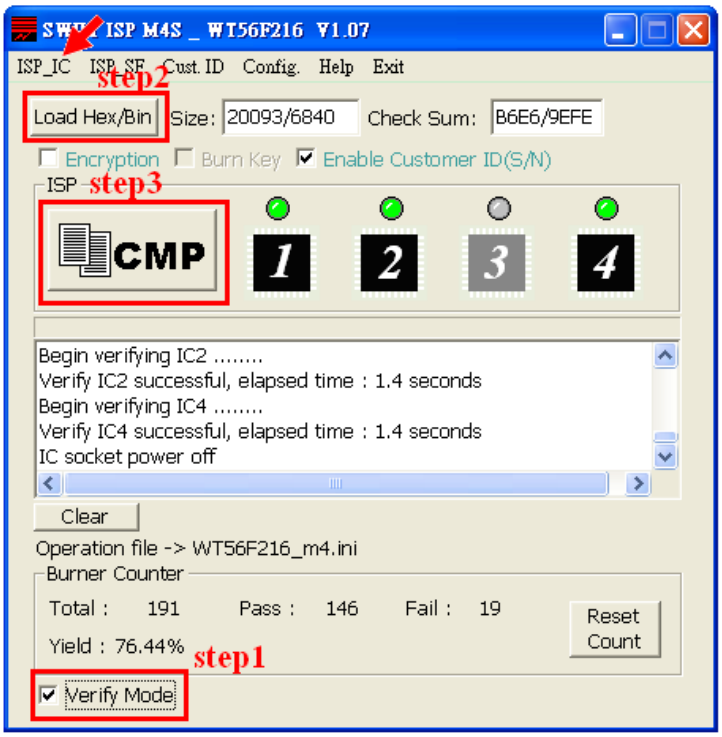
4.1.2 Verify Mode

CMP function is for SWUT-M4S comparing with Target IC, and the setting procedures are as below:

- Step 1: Confirm or execute Burn setting procedures.
- Step 2: In SWUT_M4S program start screen click **"ISP_IC"** tab, check **"Verify Mode"**.
- Step 3: Click **"Load Hex/Bin"** and select programming file.
- Step 4: Press **"CMP"** for ISP Comparing.



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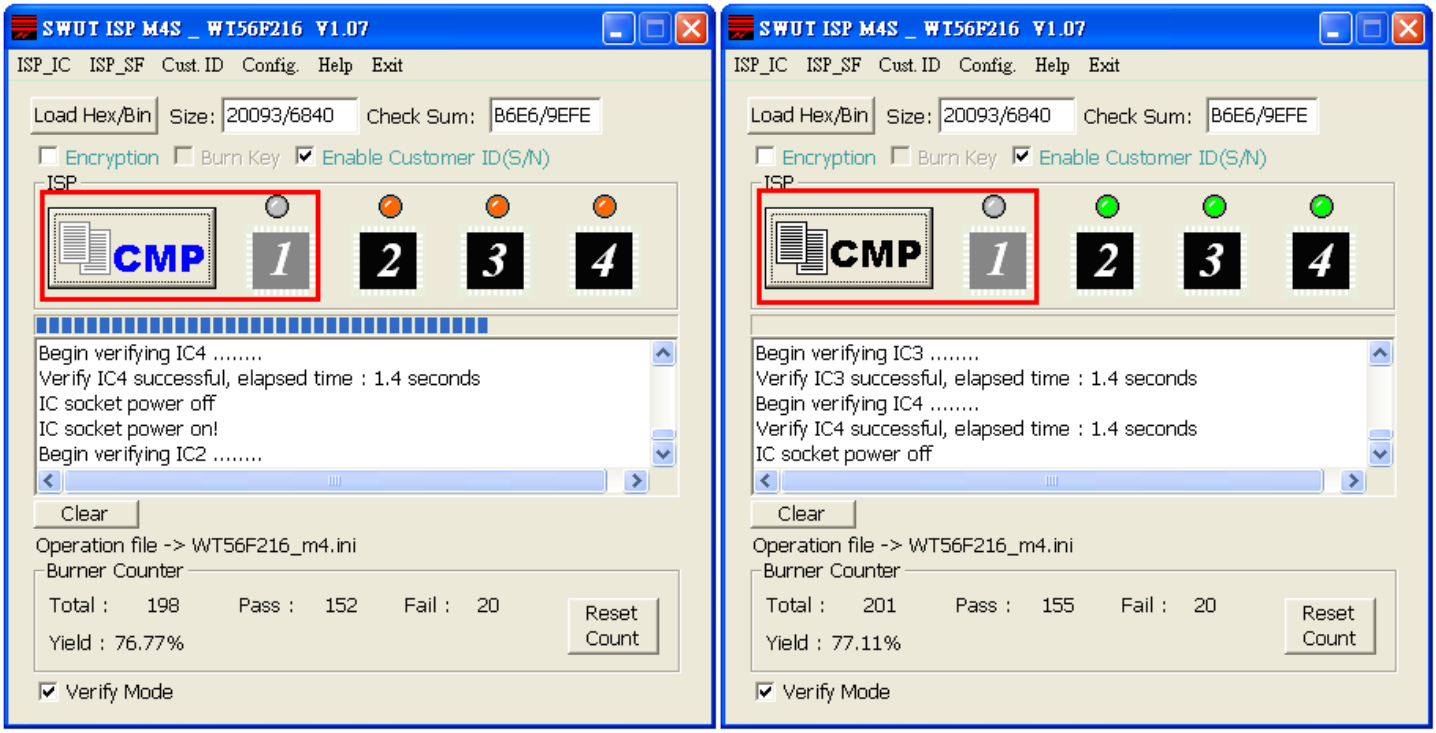
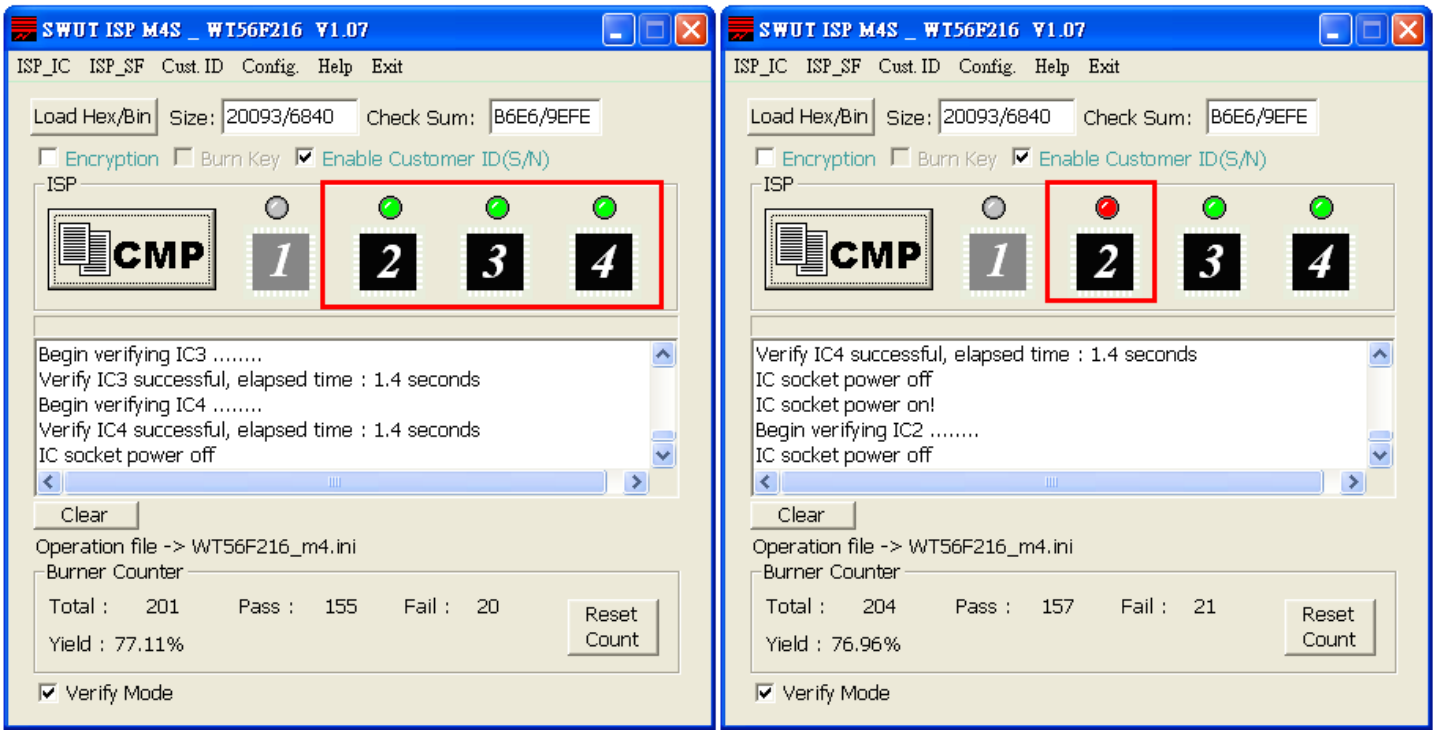
◆ If no IC is placed in IC socket, no lights will appear on the corresponding IC ICON position while executing Comparing function and after it is finished.


SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust.ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
CMP 1 2 3 4
Begin verifying IC4 .....
Verify IC4 successful, elapsed time : 1.4 seconds
IC socket power off
IC socket power on!
Begin verifying IC2 .....
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 198 Pass : 152 Fail : 20
Yield : 76.77%
Reset Count
Verify Mode
SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust.ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
CMP 1 2 3 4
Begin verifying IC3 .....
Verify IC3 successful, elapsed time : 1.4 seconds
Begin verifying IC4 .....
Verify IC4 successful, elapsed time : 1.4 seconds
IC socket power off
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 201 Pass : 155 Fail : 20
Yield : 77.11%
Reset Count
Verify Mode

◆ After comparing is finished, green light indicated successful comparing; red lights indicated failure.


SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust.ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
CMP 1 2 3 4
Begin verifying IC3 .....
Verify IC3 successful, elapsed time : 1.4 seconds
Begin verifying IC4 .....
Verify IC4 successful, elapsed time : 1.4 seconds
IC socket power off
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 201 Pass : 155 Fail : 20
Yield : 77.11%
Reset Count
Verify Mode
SWUT ISP M4S _ WT56F216 V1.07
ISP_IC ISP_SF Cust.ID Config. Help Exit
Load Hex/Bin Size: 20093/6840 Check Sum: B6E6/9EFE
Encryption Burn Key Enable Customer ID(S/N)
ISP
CMP 1 2 3 4
Verify IC4 successful, elapsed time : 1.4 seconds
IC socket power off
IC socket power on!
Begin verifying IC2 .....
IC socket power off
Clear
Operation file -> WT56F216_m4.ini
Burner Counter
Total : 204 Pass : 157 Fail : 21
Yield : 76.96%
Reset Count
Verify Mode

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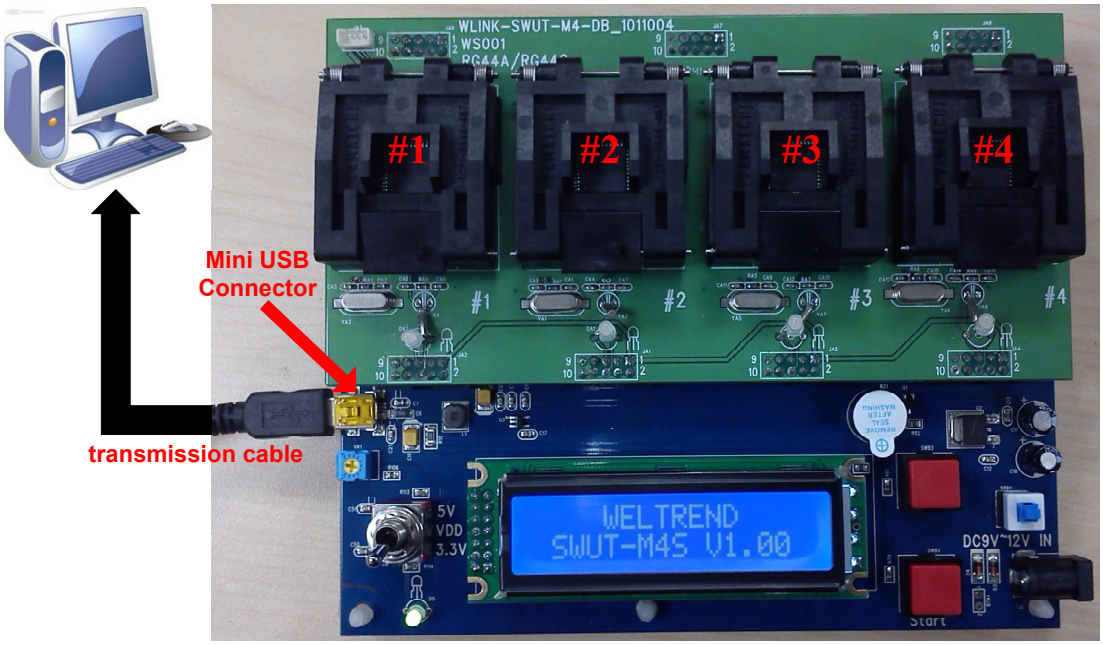
4.2 USE SWUT-M4S to BACKUP SOURCE CODE to EXTERNAL FLASH

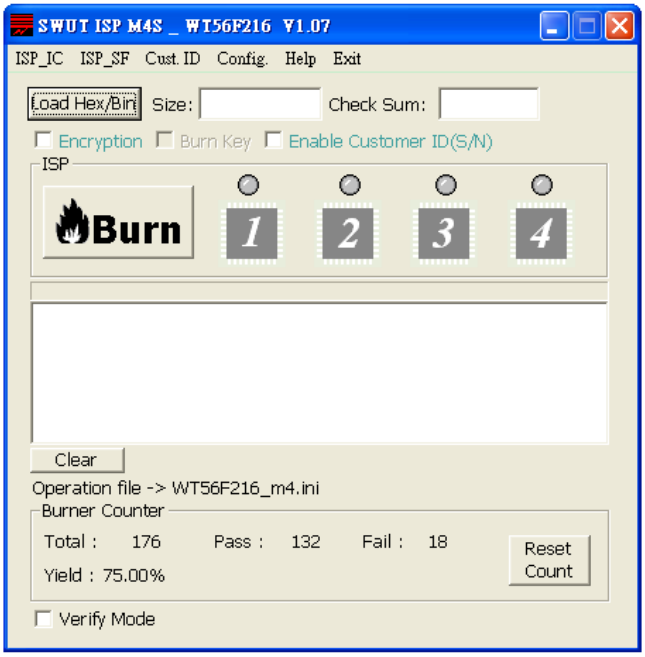
(Before using Off-line programming needs to backup source code to external Flash)

- Refer to below figure to connect PC and WLINK-SWUT-M4S USB Port, and then execute the SWUT-M4S software tooling.



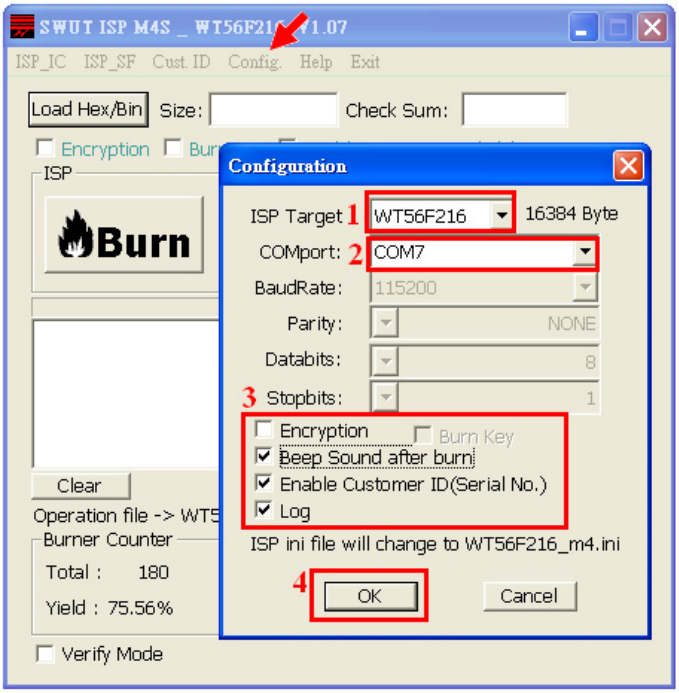
- Install WLINK USB to UART program. **(Refer to CH.1.2)**
- Click SWUT-M4S ICON to execute software tooling

◆ Program start screen as below :

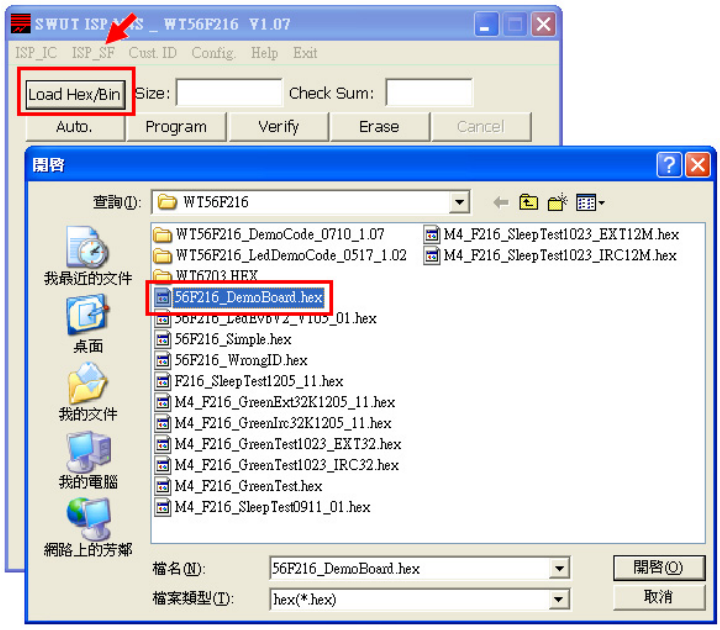


◆ Select **"Config."** tab

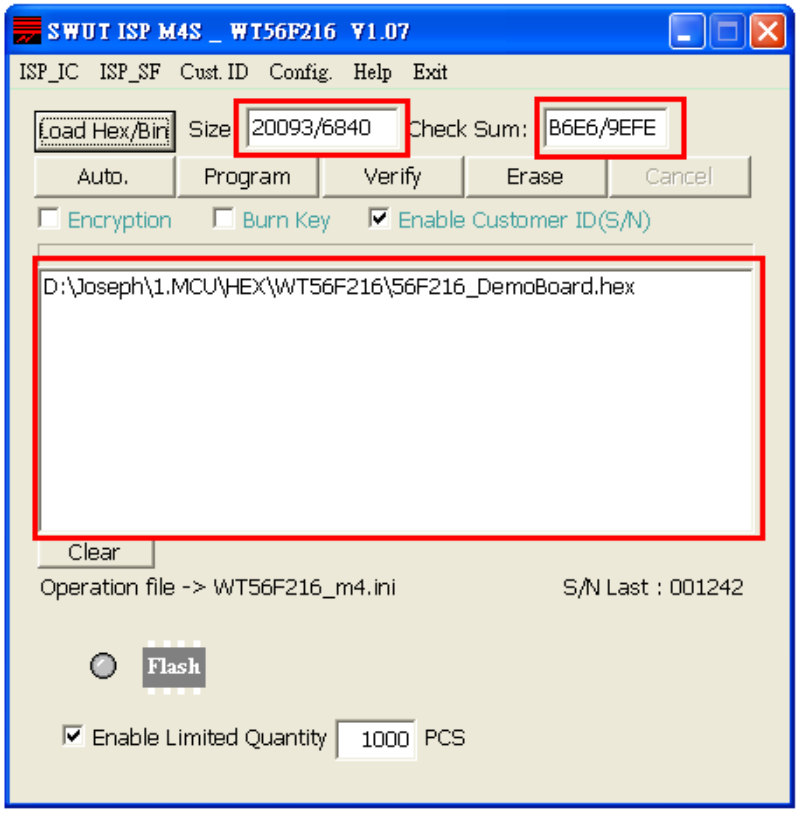
1. Setting programming Target IC
2. Configure COMport
3. Advanced setting, check programming mode (Refer to CH.3)
4. Click **"OK"** to finish setting



◆ Click **"ISP_SF"** tab at SWUT_M4S program Start screen, and then press **"Load Hex/Bin"** to select the programming file.



◆ After selecting, Size column will display program size, Check Sum column will display Check Sum, and the blank will display file path and file name.



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★ Auto: combine **"Erase"**, **"Program"**, and **"Verify"** function mentioned as above. When press **"Auto"** firstly erase external Flash then programming target file inside external Flash, and finally verify the Check Sum of source code whether are same as external Flash. If any error occurred, the window will display error message and interrupt the operation.

★ Program: Programming *.Hex or *.Bin file into the external Flash.

★ Verify: Verify Check Sum of the source code whether are same as the external Flash.

★ Erase: Erase the external Flash, and all contents are erased to be 0xFF.

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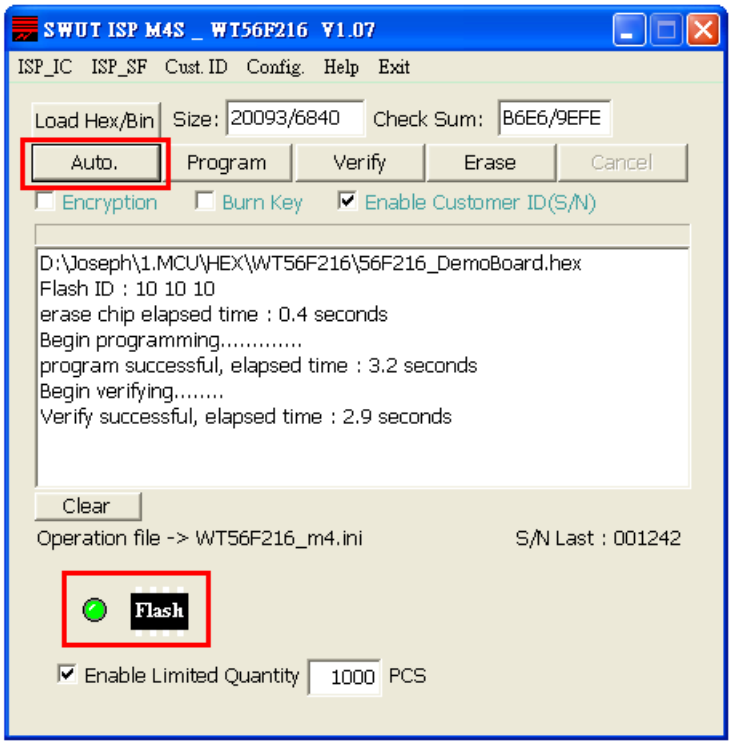
◆ Press **"Auto"** for programming. After programming is finished, green light indicated successful programming; red lights indicated failure.



4.3 SWUT-M4S Off-Line Programming Operation

Before using the off-line programming mode, please check if the programming source code is inside the external Flash of main board.

(Refer to 4.2 USE SWUT-M4S to BACKUP SOURCE CODE to EXTERNAL FLASH)

◆ Off-line Programming procedures:

1. Plug in DC 9V~12V
2. LCD shows the check sum of the source code. (Refer to 3.5.2)
3. Press "**Start**" key to enter Off-line programming.
   Meanwhile, LED lighting is orange and glittering, which indicates programming is proceeding.
4. When programming finished, LED lighting is green or red.
   Green lighting: Programming is passed
   Red lighting: Programming is failed
   LCD display will show the current programmed information, such as successful and failed programming IC quantities. (Refer to 3.5.2)

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Off-Line Programming M4S LCD description:

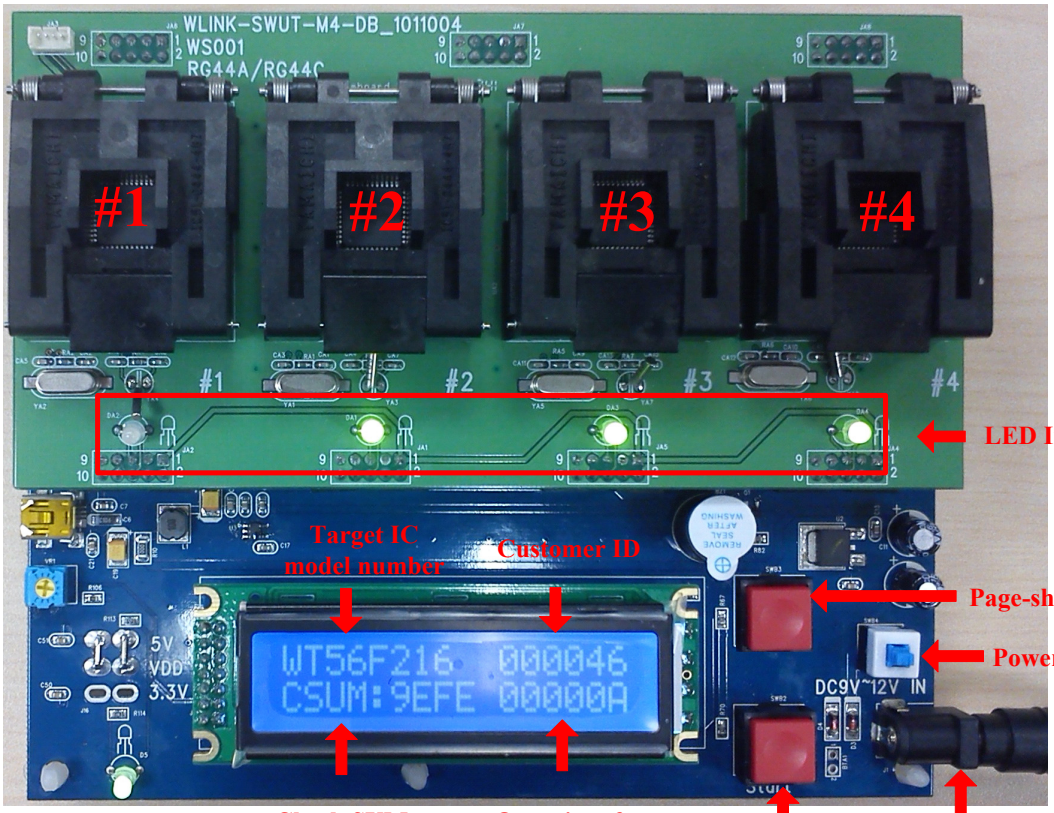
1. 4 pieces of WT56F216 successfully programmed.

Quantity of programmed successfully

2. WT56F216 successfully programmed quantity has reached the limited quantity; 2 pieces of IC failed to programming correctly.

Quantity of programmed unsuccessfully

Reach the limited quantity



LED Indicator

Target IC model number

Customer ID

Page-shift Key

Power Switch

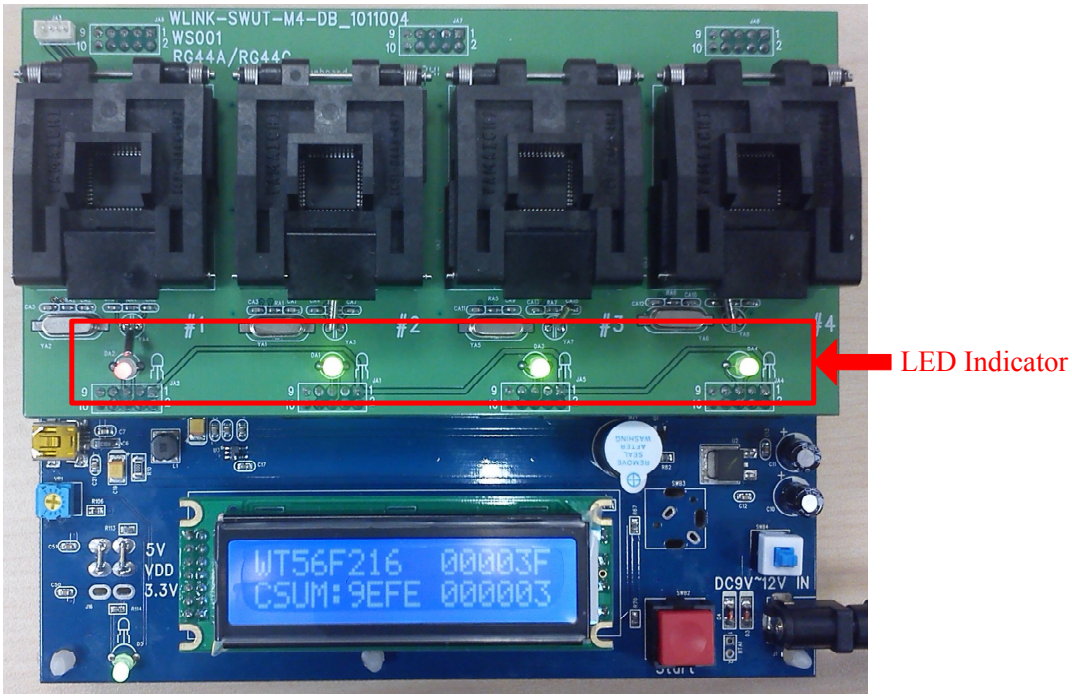
Check SUM

Quantity of Programmed successfully

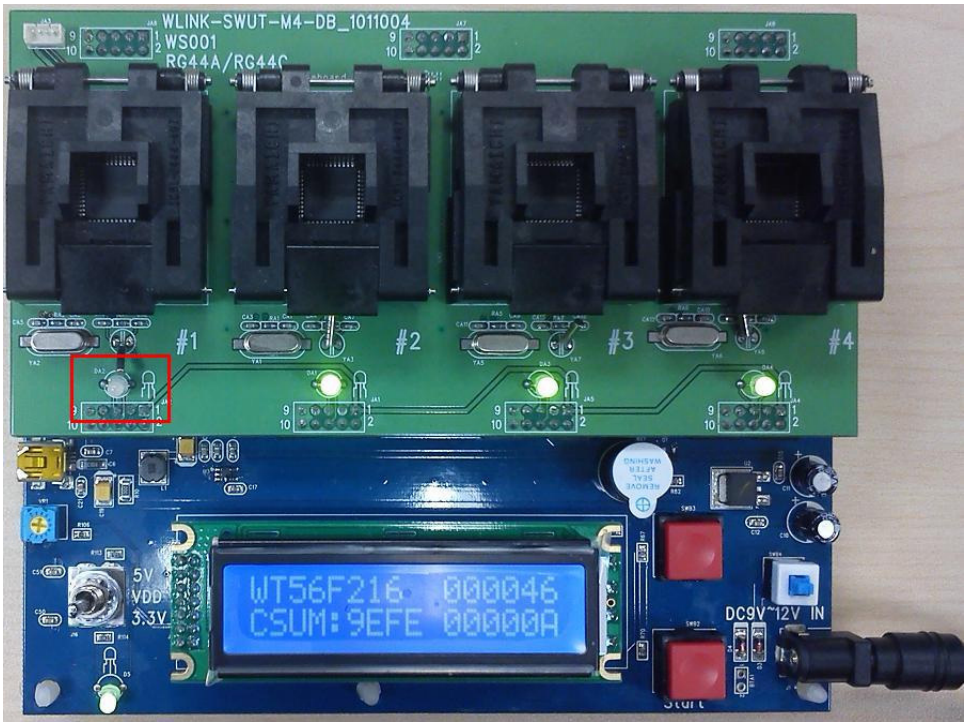
Start Key

Power Plug In

Green Light : Programmed successfully
Red Light : Programmed unsuccessfully



3. SWUT-M4S is 1-to-4 way programmer for mass production purpose as well as supports 1-to-1, 1-to-2, 1-to-3 programmer. If #1~#4 textools are blank, when press **"Start"** key and finish programming, the mapping LED of textools will not light.



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Chapter 5 WLINK-SWUT-M4S Version Comparison

WLINK-SWUT-M4			
Version	Supporting programming IC	Corresponding PC Tool	Notes
V0.17	WT56F216 WT51F104	SWUT ISP V0.97	
V0.19	WT56F216 WT51F104 WT56F108	SWUT ISP V1.00	modify R95 1K5→470R R104 4K7→1K R105 4K7→1K
V0.22	WT56F216 WT51F104 WT56F108 WT51F116 WT51F108	SWUT ISP V1.01_04	

WLINK-SWUT-M4S			
Version	Supporting programming IC	Corresponding PC Tool	Notes
V1.00	WT56F216 WT51F104 WT56F108 WT51F116 WT51F108 WT56F248 WT56F232	SWUT ISP V1.07	Add quantity limited/programming successfully and failure records/ Comparing function, etc.

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Chapter 6 Ordering Information

6.1 Supporting Product Series

Part Number	Description	Note
WT51F104	1T 8052 Micro-controller with ADC Function (FLASH)	
WT56F216	1T 8052 Micro-controller with ADC + LCD Driver (FLASH)	
WT56F108	3T 8052 Micro-controller with ADC + LCD Driver (FLASH)	
WT51F116/WT51F108	1T 8052 Micro-controller with ADC Function (FLASH)	
WT56F248/WT56F232	1T 8052 Micro-controller with ADC + LCD Driver (FLASH)	

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6.2 Ordering Information

Product Name	Description	Note
WLINK-SWUT-M4S One by Four Programmer Main Board	1-to-4 Programmer (WLINK-SWUT-M4S)	WA004
	WLINK-SWUT-M4S User Manual	DOC26

Product Name	Description	Note
WLINK-SWUT-M4S One by Four Programmer Dut Board	WT56F216/WT56F248/WT56F232 RG44AWT LQFP 44 PKG	WS001
	WT56F216 SG28AWT SOP28 PKG	WS003
	WT51F104/WT51F116/WT51F108 OG20AWT SSOP20 PKG	WS004
	WT51F104 SG140WT SOP14 PKG SG080WT SOP8 PKG	WS005
	WT51F104 MG10AWT MSOP10 PKG	WS006
	WT56F108 RG64AWT LQFP64 PKG	WS007
	WT51F116/WT51F108 MCU UG32AWT QFN32 PKG	WS009
	WT51F116/WT51F108 MG10BWT MSOP10 PKG	WS010
	WT56F248/WT56F232 RG64AWT LQFP64 PKG	WS011
	WT56F248/WT56F232 UG32AWT QFN32 PKG	WS012
	WT56F108 RG44AWT LQFP 44 PKG	WS013
	WT56F108 SG28AWT SOP28 PKG	WS014

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